Sprague Operating Resources LLC
Cumberland County
South Portland, Maine
A-179-71-O-M (SM)

Departmental
Findings of Fact and Order
Air Emission License
Amendment #1

FINDINGS OF FACT

After review of the air emission license amendment application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes Annotated (M.R.S.A.), §344 and §590, the Maine Department of Environmental Protection (the Department) finds the following facts:

I. REGISTRATION

A. Introduction

Sprague Operating Resources LLC (Sprague) was issued Air Emission License A-179-71-N-R/M on March 29, 2011, permitting the operation of emission sources associated with their South Portland bulk petroleum storage and distribution facility.

Sprague has requested a minor revision to their license to clarify emissions calculations methods from the storing and handling of residual oil and asphalt products; to include additional description of the Department's Best Practical Treatment (BPT) determination for these storage tanks; to document certain previous projects at the facility and the justifications as to why the projects did not trigger licensing requirements; and to remove Boiler #3 from the license.

The equipment addressed in this license amendment is located at 59 Main Street, South Portland, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Boiler

Equipment	Max. Capacity (MMBtu/hr)	Max. Firing Rate (gal/hr)	Fuel Type, % sulfur	Stack #
Boiler #3	1.00	7.60	Distillate fuel, 0.5%	3B

Bulk Storage Tanks

Tank Number	Capacity (barrels)	Product Stored	Tank Type
7	92,190	# 6 Oil	Vertical, Fixed Roof
201	14,062	Asphalt	Vertical, Fixed Roof
202	14,101	Asphalt	Vertical, Fixed Roof
208	108,909[1]	Asphalt	Vertical, Fixed Roof
209[2]	74,019	Asphalt	Vertical, Fixed Roof
215	24,630	Asphalt	Vertical, Fixed Roof

C. Application Classification

This amendment will not result in an increase in emissions of any pollutant from the units identified above. Therefore, this amendment is determined to be a minor revision and has been processed as such.

II. AIR EMISSION LICENSE MINOR REVISION REQUESTS

A. Air Emissions Calculations: Residual Oil and Asphalt Products

To comply with the reporting requirements of 06-096 CMR 137, *Emission Statements*, breathing and working losses from #6 fuel oil and asphalt storage tanks shall be quantified using AP-42 equations and factors, as applicable, and site-specific data including product storage temperatures and associated vapor pressures, when available.

Historically, for storage tanks subject to reporting requirements, the Department has accepted reported values of volatile organic compounds (VOC) and hazardous air pollutants (HAP) emissions calculated using EPA's TANKS model. The TANKS model is emissions estimation software based on the procedures of Chapter 7 of EPA's *Compilation of Air Pollutant Emission Factors*, also known as AP-42.

The AP-42 calculation determines the amount of hydrocarbon in the tank vapor space from the vapor pressure of the material in the tank at the liquid surface temperature, and then calculates the amount of vapor forced out of the tank due to 1) liquid being actively pumped into the tank (working losses), or 2) thermal expansion or contraction of tank contents driven by ambient temperature changes (breathing losses). The calculation requires a graph of the relationship between vapor pressure and temperature for the asphalt and estimates of the vapor phase molecular weight and partition of hydrocarbons into VOC and particulate, in addition to process data such as asphalt throughput, temperature, and tank contents level. As discussed in the introduction to AP-42, use of

[1] This tank's capacity, identified as 108,423 bbl in air emission license A-179-71-N-R/M (March 29, 2011), has been updated to reflect the most accurate and current information as provided by the source.
[2] Formerly identified as Tank 9

site-specific data is the preferred method for estimating a source's emissions because those data provide the best representation of the tested source's emissions.

The document dated April 2015 and entitled *EPA Review of Available Documents and Rationale in Support of Final Emissions Factors and Negative Determinations for Flares, Tanks, and Wastewater Treatment Systems* [Contract No. EP-D-11-084, Work Assignment No. 2-12], which presents the results of an evaluation of the veracity of AP-42 procedures to quantify emissions from petroleum storage tanks, states EPA's conclusion that the AP-42 Chapter 7 tank equations provide reasonably accurate estimates of emission rates when appropriate site-specific data are used, especially for materials like asphalt, for which no default data are available, or No. 6 fuel oil, which is often mixed with more volatile cutter material.

Based on the above information and data and sample calculations provided by Sprague, including but not limited to information relating to VOC sampling undertaken by Eastmount Environmental Services at Sprague's Searsport, Maine terminal in 2012 and 2013, the Department concludes that in order to obtain the most accurate estimates of VOC and HAP emissions from asphalt and residual fuel oil storage tanks, Sprague shall estimate emissions using AP-42 equations and factors, as applicable, and site-specific data including product storage temperatures and associated vapor pressures, when available.

B. Best Practical Treatment (BPT) for Asphalt and No. 6 Fuel Oil Storage Tanks

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). Separate control requirement categories exist for new and existing equipment.

BPT for existing emissions equipment means that method which controls or reduces emissions to the lowest possible level considering:

- the existing state of technology;
- the effectiveness of available alternatives for reducing emissions from the source being considered; and
- the economic feasibility for the type of establishment involved.

Prior to issuance of the facility's air emission license A-179-71-N-R/M (March 29, 2011), the Department evaluated the control of emissions from Sprague's tanks as compared to emissions controls commonly used in sources of similar age and design for compliance with BPT, in accordance with 38 MRSA §590(3) (1991) and 06-096 CMR 115 (3)(D)(2).

Literature and air emission licenses for other, similar sources support the BPT determination that materials exhibiting true vapor pressure below 70 mm Hg (9.3 kPa) at storage conditions are most appropriate for storage in fixed-roof tanks, while more

volatile materials require a floating roof tank or equivalent to minimize VOC and HAP emissions.

Asphalt (CAS #8052-42-4) is obtained as the non-volatile residue from distillation of crude oil or by separation as the raffinate (the material left over after a component or components have been removed) from a residual oil in a deasphalting or decarbonization process. Asphaltic materials are complex hydrocarbon mixtures characterized by large molecular size (molecular weights ranging from 500 to 2000 and carbon numbers predominantly greater than C25), high boiling temperature ranges (752-1021°F), high viscosity (a measure of a fluid's resistance to flow), low solubility, and low vapor pressure. Asphalt, a viscoelastic material, has the properties of either an elastic solid or a viscous liquid, depending on the temperature. For temporary storage purposes in Maine's climate, asphalt storage is maintained at temperatures above ambient temperatures to facilitate ease of movement and transportation. According to information provided by the source, at an asphalt storage temperature of approximately 300 °F, the vapor pressure of this product is 0.52 mm Hg.

Residual Fuel Oil (CAS #68476-33-5) has a vapor pressure of less than 5.2 mm Hg, as specified on its material safety data sheet (MSDS). No. 6 fuel oil (CAS #68553-00-4), which is part of the residual fuel oil category, has a vapor pressure of 0.2 mm Hg at 70 °F, as specified in its MSDS. For comparison purposes, at 70 °F, the vapor pressure of water is 17.5 mm Hg, and the vapor pressure of gasoline is approximately 310 mm Hg.

The Department finds no evidence contradicting its original conclusion and hereby confirms the use of fixed roof tanks and annual throughput tracking as BPT for the residual oil and asphalt storage tanks at this Sprague facility.

C. Previous Operational Changes at Sprague South Portland Terminal

The South Portland facility, previously a group of terminals owned by multiple companies, was purchased by Sprague in 1999. Sprague has made operational changes at this facility over the past several years. The rule under which minor stationary air emissions sources are licensed in Maine is 06-096 CMR 115, *Major and Minor Source Air Emission License Regulation* (Chapter 115). Changes at a licensed minor stationary source (existing) which are required to be addressed in a license amendment may be addressed according to one of three licensing procedures:

- Major Modification: applicable to any modification that would result in a significant emissions increase, as defined in 06-096 CMR 100, *Definitions Regulation*, of any regulated pollutant at an existing stationary source.

- Minor Modification: a modification which involves a licensed emission increase of four tons per year (tpy) or more of any one regulated pollutant except greenhouse gases (GHG), or eight tpy or more for total regulated pollutants except GHG, but which does not trigger Major Modification requirements.

- Minor Revision: a license revision for the correction of typographical errors; for a change in monitoring and/or reporting requirements; which involves a licensed emissions increase under four tpy for any one regulated pollutant except GHG, or eight tpy or more for total regulated pollutants except GHG; or any other changes approved by the Department that meet the criteria of a minor revision.

The regulation 06-096 CMR 100, *Definitions Regulation*, (Chapter 100) defines "modification or modified source," in part, as follows:

> "Modification or modified source" means any physical change in or change in the method of operation of a source that would result in the emission increase of any regulated pollutant, except that:
>
> **A.** Routine maintenance, repair, and replacement shall not be considered a physical change; ...

The evaluations of certain previous changes pertaining to licensing obligations in light of these definitions and Maine's licensing chapters are discussed in the following paragraphs.

Change 1: In 2000, Sprague performed maintenance on the asphalt system piping, blend system, and loading racks.

Prior to this project, there were two asphalt loading arms located next to the road and immediately adjacent to Tank 2. The project was completed to relocate the asphalt loading operations away from the road and into other, existing loading racks at another on-site location. After completion of the project, the functional use of two loading arms, one to load asphalt and the other to load asphalt blends, was replaced with the functional use of one loading arm to load either product. The piping size and pumps were not changed. The consolidation of the loading arm function from two to one decreased the capacity at the facility for asphalt loading. Thus, this project did not result in an increase in potential air emissions from the loading of asphalt and asphalt blends.

The Department confirms Sprague's conclusion that this operational change at the facility is not a modification as defined in Chapter 100 and therefore not subject to licensing requirements.

Change 2: In 2001, Sprague converted Tank 9 (now identified as Tank 209, but was identified as Tank 9 in 2001) from distillate storage to asphalt storage, including insulating the tank and installing heating coils.

This change did not result in any physical change in Tank 9 itself, but rather replaced the contents of Tank 9, previously Jet A and kerosene, with asphalt. Evaluation of the vapor pressures of these two product categories at their respective storage conditions (Jet A and

kerosene are stored at ambient temperatures; asphalt is stored at approximately 300 °F) shows very similar vapor pressures (0.44 compared to 0.52 mm Hg).

The viscosity of the two product categories is very different, however, even at their different storage temperatures. Because of this difference in physical properties, asphalt is not pumped as easily as Jet A/kerosene, thereby reducing attainable pumping rates of asphalt compared to Jet A/kerosene for the same pumping equipment. Thus, possible VOC emissions from Tank 9 were likely reduced as a result of this project because of the higher viscosity of asphalt compared to the viscosity of Jet A/kerosene; or, stated more conservatively, there is no evidence to suggest that VOC emissions from Tank 9 increased as a result of this change.

The addition of insulation and heating coils to maintain the appropriate storage temperature of the asphalt contents does not result in the emission increase of any regulated pollutant and does not constitute a modification to the emissions unit, in accordance with definitions of Chapter 100.

The Department confirms Sprague's conclusion that this operational change at the facility is not a modification as defined in Chapter 100 and therefore not subject to licensing requirements.

Change 3: In 2004, Sprague replaced a section of asphalt dock line to restore pumping efficiency.

Sprague replaced a section of the asphalt pipeline, previously an 8" diameter section which ran underground from the blending shack at the base of the dock to the tank farm. The blending shack had been a series of cross-over valves to distribute product from the dock to the previously separately owned facilities. The replacement pipeline was run straight from the dock line, raised above ground, and increased to a 12" diameter pipe to match piping on the tank farm side of the line. The pipeline from this section to the dock is still 8" diameter piping, which restricts throughput. Also, the previous line was approximately 185 feet in length, while the new section increased the length to approximately 565 feet with multiple bends, increasing back pressure in the line. In sum, this project did not increase throughput capacity and did not increase emissions from this equipment.

The Department confirms Sprague's conclusion that this operational change at the facility is not a modification as defined in Chapter 100 and therefore not subject to licensing requirements.

Change 4: In 2006, Sprague installed an asphalt blender to improve blending capability and improve efficiency and reconfigured piping to meet product movement requirements.

As needed, kerosene is mixed with asphalt to extend the asphalt season into colder weather. Prior to the completion of this project, blending took place in a series of tanks in the asphalt tank farm, and the prepared blends were stored until needed. This project eliminated the need to pre-blend, mix, and store asphalt blends, but allowed kerosene and asphalt to be blended on demand at the rack as they are loaded into a tank truck. The project did not increase throughput and resulted in the removal of 11 tanks with a cumulative storage capacity of 8,195 barrels (bbl). The removal of these tanks also eliminates the tank breathing emissions of the blend storage tanks, thereby reducing the overall emissions of the asphalt blending and loading operations.

The Department confirms Sprague's conclusion that this operational change at the facility is not a modification as defined in Chapter 100 and therefore not subject to licensing requirements.

Change 5: In 2007, Sprague converted Tank 7 from distillate fuel storage to residual oil storage, which included insulating the tank, installing heating coils, and installing a steam generator.

The installation of tank insulation and heating coils did not result in the emission increase of any regulated pollutant and did not constitute a modification to the emissions unit, in accordance with definitions of Chapter 100 and based on EPA's TANKS model, which was used at the time to estimate emissions.

The steam generator is not a fuel-burning unit, but rather obtains heat to make steam from an existing hot oil burner system which was already being operated. [See Heaters 1, 2, and 3 in Air Emission License A-179-71-N-R/M (March 29, 2011).] Heat from the hot oil lines is utilized to make steam; thus, there are no air emissions from the steam generator. No additional fuel use in the Heaters has been noted as a result of the addition of this steam generator.

As stated in 06-096 CMR 115 (1)(B), once a source requires an air emission license, all emissions units which emit regulated pollutants at the source must be included in the license. Because the added steam generator does not create air emissions, and no additional emissions were generated from the existing (licensed) hot oil burner system already in use, the steam generator was not required to be included in the facility's air emission license. Thus, this 2007 change did not constitute a modification under Maine's air licensing rules and did not trigger licensing requirements.

D. Removal of Boiler #3 From the Air Emission License

Sprague is licensed to operate several fuel burning units, including Boiler #3. Boiler #3 was rendered inoperable in January 2012 and has since been removed from the facility. Boiler #3 is hereby removed from Sprague's air emission license.

Boiler #3 was replaced by small propane-fired heaters with heat input capacities below licensing thresholds as identified in 06-069 CMR 115; thus, these units are not addressed further in this license amendment.

D. Annual Emissions

The facility's annual emissions are not being revised with this amendment and shall remain as currently licensed.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License Amendment A-179-71-O-M subject to the conditions found in Air Emission License A-179-71-N-R/M and the following conditions.

Severability. The invalidity or unenforceability of any provision of this License or part thereof shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

SPECIFIC CONDITIONS

Specific Condition (16) (C) and (H) of Air Emission License A-179-71-N-R/M (March 29, 2011) shall be replaced with the following:

(16) **Boilers/Heaters**

C. When firing #2 fuel oil, emissions shall not exceed the following [06-096 CMR 115, BPT]:

Emission Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Heaters 1, 2, 3 (each)	0.79	0.79	4.99	2.97	0.35	0.02
Boiler 5	0.16	0.16	1.02	0.60	0.07	0.01

H. Sprague shall implement a boiler tune-up program to include the tune-up of Boiler 5 within one year of the date of publication of 40 CFR Part 63 Subpart JJJJJJ in the federal register. [40 CFR Part 63.11196)(a)(1)]

Specific Condition (21) of Air Emission License A-179-71-N-R/M (March 29, 2011) shall be replaced with the following:

(21) **Recordkeeping**

For all recordkeeping required by this license, the licensee shall maintain records of the most current six-year period. [06-096 CMR 115, BPT]

A. Records shall be maintained showing the average annual information for each of the petroleum storage tanks in order to calculate annual VOC emissions:

1. Quantity and type of petroleum liquid stored in each tank,

2. Reid vapor pressure,

3. Maximum true vapor pressure,

4. Average storage temperature,

5. Average throughput in each tank,

6. Tank emissions calculated using EPA TANKS program or an alternative approved by the Department. This statement notwithstanding, to comply with the reporting requirements of 06-096 CMR 137, *Emission Statements*, breathing and working losses from #6 fuel oil and asphalt storage tanks shall be quantified using AP-42 equations and factors, as applicable, and site-specific data including product storage temperatures and associated vapor pressures, when available.

7. Tank truck emissions assuming 1.3% of the vapors are displaced during loading (based on assumed capture efficiency of 98.7% as given in 40 CFR Part 63, Subpart R), and

8. HAP speciation data as given by the American Petroleum Institute (API) or other speciation data as obtained by a supplier.

Specific Condition (22) of Air Emission License A-179-71-N-R/M (March 29, 2011) shall be replaced with the following:

(22) **Annual Emission Statement**

In accordance with *Emission Statements*, 06-096 CMR 137 (as amended), the licensee shall annually report to the Department, in a format prescribed by the Department, the information necessary to accurately update the State's emission inventory. The emission statement shall be submitted by the date as specified in 06-096 CMR 137.

DONE AND DATED IN AUGUSTA, MAINE THIS 21 DAY OF July , 2015.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for
PATRICIA W. AHO, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-179-71-N-R/M.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: June 8, 2015
Date of application acceptance: June 15, 2015

Date filed with the Board of Environmental Protection:

This Order prepared by Jane E. Gilbert, Bureau of Air Quality.

Filed
JUL 21 2015
State of Maine
Board of Environmental Protection